

Amendments to the Specification:

Please change the Title of the Invention, on page 1, lines 1-2, to the following rewritten title:

**METHOD OF MANUFACTURING OPTICAL-QUALITY POLARIZED PART
INCORPORATING HIGH-IMPACT POLYURETHANE-BASED MATERIAL**

Please replace the paragraph beginning on page 1, line 5, with the following rewritten paragraph:

This is a divisional of U.S. Patent Application Serial No. 09/804,785, filed March 13, 2001, which is hereby incorporated by reference as if fully set forth herein.

Please replace the paragraph beginning on page 4, lines 6-13, with the following rewritten paragraph:

Initial tests, however, ~~lead~~ led the inventors to believe that their modified high impact polymeric material could not be utilized to manufacture optical-quality polarized plastic parts. In early attempts to combine their modified high impact polymeric material with standard polyvinyl alcohol (PVA) polarized film using conventional techniques, the film was consistently displaced and bent out of shape during the introduction of the material. Thus, initial testing revealed that a substitution of their high impact material for standard lens thermoset resin materials and conventional manufacturing processes was not possible.

Please replace the paragraph beginning on page 11, lines 1-15, with the following rewritten paragraph:

Surprisingly, the inventors found that the rapid exothermic polymerization reaction of the present high impact polyurethane results in good adhesion to polarizer wafers. Typically used with thermoplastic parts, wafers comprise protective plastic layers on one or both sides of a polarizer film to increase the environmental durability and ease in handling of the polarizers. Three layer wafer constructs sandwich the polarizing film for protection and support on both surfaces. Two layer wafers (alternate material/polarizer film) may provide a supporting layer on one surface, or a single protective covering toward the outer surface of the optical part. Wafers, however, being thicker and usually laminated often do not conform to highly curved or non-symmetrically curved shapes and subsequently separate at the lamination interfaces due to stress fracturing. In addition, such wafers may require the much higher temperatures of thermoplastic processing in order to conform to such shapes, or to join reliably with the introduced lens materials. Thermoplastic molding temperatures Resin temperatures in thermoplastic molding are commonly in the range of 260-320°C rather than the 70-130°C used in thermoset resin casting. Due to the foregoing deficiencies, wafers are not commonly used with thermoset resins.

Please replace the paragraph beginning on page 12, lines 4-14, with the following rewritten paragraph:

With respect to materials of a freestanding polarizing film, these preferably include polyethylene terephthalate (PET) films, although PVA films may be used. PET polarizers, as disclosed in United States Patent ~~Application Serial No. 09/475,424~~ No. 6,220,703, which is and hereby incorporated by reference, are preferred because they are stable and exhibit low birefringence, among other beneficial properties. Notwithstanding PET's potential advantages, the inherent inertness of PET should be overcome for the manufactured optical product to have adequate structural integrity. Thus, to effectively incorporate PET film as polarizer 104, methods to overcome PET's inertness for bonding should be employed. Such methods are fully disclosed in the above-identified patent application and United States Patent ~~Application Serial No. 09/567,711, which application~~ No. 6,413,641, which is hereby incorporated by reference.

Please replace the paragraph beginning on page 13, lines 19-21 and page 14, lines 1-9, with the following rewritten paragraph:

As illustrated in Fig. 3, the polarizer, such as polarizer 104, may be treated for improved adhesion at step "If desired, treat or condition polarizer for adhesion improvement." Previously reported treatments of polarizers, such as nitrocellulose coatings on CAB polarizer wafers (United States Patent No. 3,833,289) and polyvinyl butyral coating on polarizer sheets (United States Patent No. 4,090,830), did not prove reliable for ophthalmic lens processing. Therefore, the inventors investigated alternate coatings, as well as chemical and/or physical treatments of polarizer films, for improved adhesion. Details of surface treatments and chemistries for improved bonding are disclosed in United States Application Serial Nos. ~~09/475,424 and 09/567,711~~ Patent Nos. 6,220,703 and 6,413,641, mentioned previously. Such treatments include mechanical roughening, physical cleaning, chemical surface modification, plasma activation, and coating of the polarizers.

Please replace the paragraph beginning on page 15, lines 11-16, with the following rewritten paragraph:

With the method illustrated in Fig. 3, the user may also advantageously be able to apply positive or negative pressure against the polarizer to conform it against the front surface before or during the admission of the liquid-phase polymeric material. Such pressure may be accomplished, for example, by using a gasket or cavity sealing mechanism such as that described in U.S. Patent ~~Application Serial No. 09/447,445, which application~~ No. 6,391,231, which is incorporated herein by reference as if fully set forth herein.

Please replace the paragraph beginning on page 17, lines 8-16, with the following rewritten paragraph:

Since this reactive polymeric material solidifies so quickly, the inventors, through their initial failures, recognized that conventional techniques that depend on solidification lasting several hours could not be used. In order for an acceptable optical-quality plastic part to be effected, the inventors turned to one of their earlier inventions. In particular, the inventors turned to their sidefill gasket technology disclosed in United States ~~Application Serial No. 09/447,445~~ Patent No. 6,391,231. Sidefill gaskets and methods as detailed therein incorporate extra vents to remove entrapped gases either by passive or active (e.g., vacuum) methods. A further refinement may include automation for reproducible and accurate filling.

Please replace the paragraph beginning on page 21, lines 18-21 and page 22, lines 1-11, with the following rewritten paragraph:

At step 22 "Position polarizer within optical part mold assembly," the polarizer is positioned and supported within the mold assembly such that liquid-phase polymer material may be introduced on both sides of the polarizer. This means that the polarizer is not resting against either of the outer molding surfaces. The inventors gasket assembly disclosed in United States ~~Application Serial No. 09/447,445~~ Patent No. 6,391,231 is a suitable gasket that may be used to support and securely position the polarizer within the thickness of such an assembly. Depending on the final use of the optical part, the polarizer may be positioned equidistantly from each outer molding surface, or nearer one surface than the other. For example, to form a semi-finished ophthalmic lens blank (commonly 6-15 mm total thickness), it is preferable to position the polarizer within 1.5 mm to 0.5 mm of the front molding surface. This ensures that the lens blank can be ground to prescription without cutting into the polarizer, even for lenses with a final center thickness of 2.2 to 1.8 mm. However, for display or non-prescription eyewear applications, it may be preferable to place the polarizer equidistant within the optical part for optimal protection on both sides of the polarizer.

Please replace the paragraph beginning on page 22, lines 12-22 and page 23, lines 1-3, with the following rewritten paragraph:

To form the optical polarized part illustrated in Fig. 4, liquid-phase polymeric material is introduced on both sides of the polarizer at step 32. The disclosed gaskets of United States ~~Application Serial No. 09/447,445~~ Patent No. 6,391,231 advantageously allow simultaneous introduction of material on both sides of the polarizer layer, thereby preventing displacement of the polarizer as the material quickly reacts and hardens. Such a method of controlled simultaneous introduction is preferred with this quickly solidifying material to avoid flow lines or voids against the polarizer layer that would degrade the optical performance. Similarly, the filling through-hole(s) of these gaskets may be specifically designed to admit equal or differential distribution of the material around the polarizer, as required to achieve equal or dissimilar thicknesses of polymeric material on the front and back surfaces of the polarized optical part. As in Fig. 3, the through-holes also offer an important advantage in providing reservoirs of material to ensure fully filled parts even upon reactive shrinkage, and to allow passages for egress of gases.

Please replace the paragraph beginning on page 23, lines 19-21 and page 24, lines 1-2, with the following rewritten paragraph:

At step 30 "Admit liquid polymeric material behind polarizer to fill back of mold," the liquid polymeric material is introduced only behind the polarizer to press it against the front surface. Again, active or passive means to assist conformance of the polarizer to this surface may be included such as a gasket disclosed by United States ~~Application Serial No. 09/447,445~~ Patent No. 6,391,231.

Please replace the paragraph beginning on page 28, lines 3-10, with the following rewritten paragraph:

Example 2. This example is representative of the manufacturing method illustrated in Fig. 3. A thermoset mold cavity was assembled with the polarizer resting against the front mold surface. Using a sidefill gasket design as disclosed in United States ~~Application No. 09/447,445~~ Patent No. 6,391,231, wherein the gasket has vent holes in addition to a filling port, liquid-phase polyurethane-based material was admitted to only the region of the assembly behind the polarizer film. The lens was allowed to solidify at room temperature for a duration less than 10 minutes (until mixture gels). The lens was placed in an oven to continue its reactive cure at 121°C for 16 hours.

Please replace the paragraph beginning on page 28, lines 11-12 and page 29, lines 1-11, with the following rewritten paragraph:

Example 3. This example is representative of the manufacturing method illustrated in Fig. 4. A thermoset mold cavity was assembled with a polarizing layer using a sidefill gasket design as disclosed in U.S. Patent ~~Application Serial No. 09/447,445~~ No. 6,391,231. Specifically, a slot-shaped port hole acted as the fill port to introduce, in a controlled manner, the thermosetting resin material along the edge axis of the embedded layer. Two port holes functioning as vent holes were located above the edge axis of the embedded material, i.e., on the thinner side of the lens to allow egress of any gases from the front surface of the lens. An additional vent port was located below the edge axis of the embedded material on the thicker side of the lens to allow egress of any gases from the back lens surface. A curved fill nozzle designed to match the slot-shaped fill port was used to introduce material into the cavity around the polarizing layer until the cavity was full and a small amount of material flowed out of the egress holes. After standard curing as in Example 1, the gasket was removed.

Please replace the paragraph beginning on page 29, lines 14-19 and page 30, lines 1-3, with the following rewritten paragraph:

Example 4. This example is representative of the manufacturing method illustrated in Fig. 5. A thermoset mold cavity was assembled with the polarizer resting against the front mold surface. Using another sidefill gasket design as disclosed in U.S. Patent Application Serial No. ~~09/447,445~~ No. 6,391,231, liquid-phase polymeric material was admitted to only the region of the assembly behind the polarizer film. This material was allowed to solidify for ten minutes, then the front mold surface was removed and another mold surface spaced 1 mm away from the polarizer film was placed in the assembly. Resin was then inserted into this newly formed front lens region to cover the front surface of the polarizer and assume the new front curvature of the lens cavity.